

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LIVERPOOL.—Mr. J. Mercer has been appointed assistant lecturer in mathematics and Mr. T. E. Garner assistant lecturer in organic chemistry.

A lectureship in plant physiology has been established in the botanical department through the generosity of Mr. W. P. Hartley (the donor of the laboratories).

Prof. Ronald Ross has been granted leave of absence for five months to enable him to report on measures for the prevention of malaria in Mauritius for the Colonial Office.

Prof. A. W. Mayo Robson will deliver the Mitchell Banks Memorial Lecture during the session 1907-8.

At the graduation ceremony held in St. George's Hall on July 13, *ex officio* degrees were conferred on several members of the staff, including Emeritus Prof. Paul, Dr. E. A. Browne, Prof. Watkinson, Mr. J. Wemyss Anderson, Associate Profs. Aspinall, Brodie, and Bromley Holmes. The dean of the faculty of science (Prof. Harvey-Gibson) presented the following for the degree of Doctor of Science, *honoris causa*, viz.:—Prof. A. R. Forsyth, Prof. F. Gotch, Sir Oliver Lodge, Sir Henry Roscoe, Sir William Ramsay, Sir John Murray, Prof. Ostwald, Prof. Osler, and (*in absentia*) Dr. C. L. A. Laveran. Sir Alexander Kennedy was presented for the degree of Doctor of Engineering by Prof. Watkinson.

MR. ADAM SEDGWICK, F.R.S., has been elected professor of zoology and comparative anatomy in the University of Cambridge in succession to the late Prof. Newton.

SIR DOUGLAS FOX will deliver the inaugural address of a nature-study course for women, to be held at the Horticultural College, Stanley, from Saturday, July 27, to Saturday, August 10.

THE council of the City and Guilds of London Institute has conferred the fellowship of the institute upon Mr. Alfred E. Young, chief surveyor of the Federated Malay States, for his original and valuable work in the trigonometrical survey of the Malay States.

THE annual meeting of the Midland Agricultural and Dairy College will be held on Monday, July 29, at 3.15 p.m., when the report on the year's work will be presented. Sir John Colleston will address the meeting and present the certificates gained during last session.

At Bedford College for Women (University of London) the following courses, open free to teachers in secondary and elementary schools in the county of London, will be given in the Michaelmas term:—"Geology for Teachers of Physical Geography" by Dr. C. A. Raisin, beginning Wednesday, October 9, 6 p.m.; "The Organisation of Nature-study Courses in London Schools," by Miss M. R. N. Holmer, beginning Saturday, October 5, 10.30 a.m. Syllabuses of the lectures can be obtained on application to the principal.

THE East London College, which has gradually been evolved from the educational work connected with the "People's Palace," has been accorded the position of a school of the University of London by the Senate of that body. It has long been felt that there should be a school of the University in the eastern half of London; and for this position the East London College is admirably suited. The chemical department, under the charge of Dr. J. T. Hewitt, has done valuable work. Prof. C. H. Lees, F.R.S., was recently appointed head of the physics department, and the laboratories have been re-equipped and extended, while large grants have been made for the mechanical and electrical engineering departments by the Drapers' Company. Much research work has been accomplished under the professor of electrical engineering, Prof. J. T. Morris, and mathematics is showing signs of considerable development at the college.

THE need of reform at Oxford is urged in a letter signed by leading advocates of progressive learning in Wednesday's *Times*. It is pointed out that many members of the University are of the opinion:—(1) That the constitution and machinery of Oxford, both legislative and executive, need revision; (2) that the relations between the University and its colleges, both constitutional and financial, require

modification; (3) that a central direction of our studies is required enabling the faculties to have the authority assigned to them in other seats of learning; (4) that the studies of the University are themselves too narrow in scope and that fresh endowments of various branches of study are necessary, and especially that a greater encouragement should be given to research, which at Oxford is probably to a larger extent divorced from teaching than in any other great university. As attempts at reform have again and again proved abortive, the signatories consider that either a fresh commission, or, if that suffices, legislation by the King in Council, as contemplated by the last commission, are the only practical ways of carrying out the necessary changes.

"THE influence of a body of thoroughly competent, zealous, and conscientious teachers in our public elementary schools may plainly be an important factor in our national life," says Sir Robert Morant in his prefatory memorandum to the new regulations (Cd. 3597) for the training of teachers and for the examination of students in training colleges. The general spirit of the regulations is likely to encourage work which will produce teachers of the right kind. The time for training is at best short, and it is important that the essential needs of the future teacher should receive primary consideration; the Board rightly warns college authorities against undertaking any too ambitious scheme. Where a university course of work is permitted to a student training to become an elementary-school teacher, the regulations insist that it shall not be at the sacrifice of some fundamental study or of facilities for obtaining practice in the art of teaching. Following the regulations of previous years, the necessity for inculcating the scientific method in the teaching of all subjects, and not confining such attempts to the instruction in science, is insisted upon. The memorandum admirably urges also that:—"The study of natural objects . . . should be so conducted as to encourage accurate observation and the careful recording of what is seen, with a view to the growth of an independent habit of thought, and the furnishing of a well-defined field of knowledge derived from immediate observation by the scholar." The necessity for lessons in elementary schools designed to familiarise children with the chief laws of health is now recognised by everyone, and great importance is to be attached by the Board to the education in this subject received by the student in training. The regulations as a whole will be read with satisfaction by all who have at heart the educational welfare of elementary-school children.

IN the third of the annual Harvard lectures, delivered at Yale University last April, Prof. A. Lawrence Lowell, the lecturer for the year, dealt with the subject of American universities. These lectures are the outcome of a fund provided by an anonymous Harvard graduate. In his lecture, which is published in *Science* for June 28, Prof. Lowell raises many points of wide interest. After directing attention to the value to civilisation of the great European universities at the close of the Middle Ages, he said that American universities are not only growing larger, but their influence is extending more widely through the body politic. In addition to being training places for young men, the universities in the States aim at diffusing learning directly or indirectly through all strata of society, helping to bring light to anyone who wants it. It is being more fully understood, too, that a university should not be merely a local institution, but one bringing together students from all parts of the country. As Prof. Lowell remarked, "should a general custom arise for every man to attend exclusively the university in his own neighbourhood, it would be a great misfortune to education in America." Referring to the two classes of universities in the United States, Prof. Lowell instituted an interesting comparison between State universities and those not supported by taxation. He comes to a similar conclusion to that arrived at by President Pritchett in the first bulletin of the Carnegie Foundation, that the most vigorous of the State universities have been, as a rule, those which have thrown themselves most completely upon the State and obtained the smallest fraction of their support from private benefaction. We commend this experience to British statesmen in the hope that American experience of

the great value to the community of universities endowed from State funds may lead them to emulate American practice in this respect.

THE regulations for secondary schools (Cd. 3592) issued by the Board of Education, to come into force on August 1, mark a distinct advance in educational administration. More elasticity is to be allowed in the Board's dealings with secondary schools; more encouragement is to be given to local initiative and local effort; and certain defective features in older regulations are removed. The additional funds now available for secondary education have made it possible to abolish the limited four years' course on which alone grants have been paid hitherto. A uniform grant will in future be paid on pupils between twelve and eighteen years of age who are following an approved curriculum, and, what is of prime importance from the point of view of the schoolmaster, the term instead of the year is to be taken as the unit in assessing grants. The subjects to be studied and the time to be devoted to each has in the past been prescribed by the Board; for the future the head teacher and local authorities are to be encouraged to submit to the inspector for approval courses of work designed precisely to suit local needs and conditions. In the payment of grants it is interesting to note that the Board is prepared in certain cases to augment the grant due to a school by a further sum towards meeting expense incurred by the school in respect of approved educational experiments. There is ground for hope that this arrangement may hasten the methodical building up of a science of education. This adoption of the plan followed in all other scientific work of basing conclusions upon experiment and observation should lead to many improvements, and it is to be hoped that much thought and the best talent will be devoted to the inauguration of the age of scientifically arranged experiments in education. The regulations will, if sympathetically and intelligently interpreted, greatly improve English secondary education.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 6.—"The Mechanical Effects of Canal Rays." By A. A. Campbell Swinton. Communicated by Sir William Crookes, F.R.S.

This investigation was undertaken in order to discover whether the so-called canal rays, which at suitable pressures can be seen streaming through the apertures in a perforated kathode, backward away from the anode, share with kathode rays the property of causing small and light mill-wheels to rotate.

Experiments were conducted with tubes in which there were a number of perforations in the kathode, so that the canal rays, after passing through these, impinged on the vanes of a mill-wheel of screw-propeller form, and also with other tubes in which there was only a single perforation in the kathode, and the canal rays acted on the vanes of a mill-wheel of water-wheel type. In both these forms of tubes mill-wheels with vanes of mica, as also with vanes of aluminium, were employed, and in every case rapid rotation of the mill-wheel occurred at suitable pressures in the direction corresponding with that of the canal rays. That this was due to the canal rays was proved by closing the apertures in the kathodes by means of aluminium shutters, when rotation could not be produced, as also by subjecting the tube to a powerful magnetic field so as to deflect to one side all direct or reflected kathode rays.

Experiments were also made with screw-propeller mill-wheels mounted in front of the kathode. In this case, when the vanes of the mill-wheel were of mica, the rotation obtained always corresponded with the result being due to bombardment by kathode rays proceeding away from the kathode; whereas, when the vanes were of aluminium, rotation in the contrary direction invariably took place, this corresponding with the effect being due to canal rays proceeding towards the kathode.

It was further ascertained by means of two thermojunctions of Constantan copper—one on each side of a mica vane, arranged so as to oppose their E.M.F.'s, and connected to a mirror galvanometer—that under canal-ray

bombardment the two sides of a mica vane may acquire differences of temperature amounting to as much as 200° F. It is suggested that the heat insulating properties of mica and the high thermal conductivity of aluminium have probably an important bearing on the divergent results obtained with these two materials, as mentioned above.

Physical Society, June 28.—Prof. W. E. Ayrton, F.R.S., past-president, in the chair.—Experiments on the production of sand ripples on the sea shore: Mrs. Ayrton. The sand-ripples of the sea-shore, although parallel to the line of the breakers, are not produced by their edges, but entirely under water. The long see-saw motion of the water produces the ripples, as was observed in 1882 by Mr. A. Hunt. To show this a glass trough, in which was level sand, covered with a foot of water, was pushed to and fro on rollers. This motion set the water oscillating, and soon small ridges were seen in the sand, at nearly equal distances from one another, growing larger as the oscillation continued. By deduction from the shape of certain sand vortices, it appears that every ridge in otherwise smooth sand must produce two other ridges, one on either side of the first, and that these two give rise to two other ripples, until the whole becomes ripple-marked. Experiments were shown to demonstrate this fact. To show that the vortices generated by the original ripple swept out those succeeding, an artificial barrier was put across the trough to increase the size of the vortices, a handful of moist black pepper was thrown in, and the water oscillated. Immediately the actual process by which the water started and built up the ripples was shown. The way was illustrated in which the ripples on the sea-shore could be imitated, even when the water ran in one direction alone, if only the sand were sloped so that the water ran up it, and if, by means of a paddle, a series of waves were sent along the water in the direction in which it was running. The whole of the sandy shore is ripple-marked when the tide is high, but the waves at the edge of the retreating tide wipe out the ripples except where there is a pool, so that the water is left over the ripples until after the sea has retired. The greatest depth at which ripple-mark can be formed at the bottom of the sea depends on the violence of the motion of the water. At depths of 60 feet or 70 feet the sand is said to have been found ripple-marked. If the depth of a vessel is large compared with its cross-section, a depth of water can be found beneath which no sand-ripples can be formed. On sprinkling a little sand in the water in a small trough, and rocking it to and fro, the sand was seen to assemble quickly in a straight line across its middle. Watching these grains, it was noticed that the result arose from every swing carrying each grain on one side of the centre nearer to the middle than the next swing carried it away again. Each ripple as a whole tends to move towards the middle of the trough. In troughs, the water was kept oscillating so as to form a stationary wave twice the length of the trough, and the place where the heap of sand was formed was where the level of the water changed least, and its horizontal velocity was the greatest. Referring to the Goodwin Sands, Mrs. Ayrton said she found it impossible to avoid recognising the resemblance between the hillocks and hollows of these sands and those made in her glass troughs, and it seemed possible that they were also produced by stationary waves.

CAMBRIDGE.

Philosophical Society, May 20.—Dr. Hobson, president, in the chair.—Exhibition of photomicrographs of wood-sections made by Mr. J. A. Weale: E. R. Burdon. —Parasitic trees of southern India: C. A. Barber. The sandal tree, *Santalum album*, was discussed; although a large tree with abundant foliage and thick stem, it is dependent for its water and mineral salts on the roots of other plants. The disease called locally "spike" was illustrated by a series of lantern-slides. Four genera of Olacaceæ, *Olax*, *Ximenia*, *Opilia*, and *Cansjera*, large green climbers or shrubs, are now known to be parasitic like the sandal. The arrangement of the subgroups of the Olacaceæ has been unsatisfactory for a long time. The study of the haustoria endorses the arrangement proposed by Van Tieghem whereby the *Opiliæ* are transferred to near the *Santalaceæ*. Special attention was directed to the